them to become sternotribe, should finally become the highest specialized of nototribe flowers, far outstripping those which became nototribe more readily, and assuming adaptations which aim at all parts of the upper sides of insects. Thus, Orchis pyramidalis[18] fastens its pollinia on the upper side of the proboscides of Lepidoptera; O. spectabilis fastens them on the smooth part of the face of female humblebees; Habenaria orbiculata, on the eyes of Sphingidæ;[19] Calopogon parviflorus, on the first segment of the abdomen of small bees;[20] the Calopogon seems to have gone through some remarkable changes. From being regular and dusting pollen indefinitely on the visitor, it first changed so as to dust the ventral surface. Then, inverting, it fastened the pollen on the upper side of the bee. Then it turned right side up again; but it has not, however, become again sternotribe, but remains the most remarkable of nototribe flowers. It has quit turning upside down to strike the insect's back. It turns the insect upside down to strike its stigma. As far as I know, Calopogon is the only nototribe flower of shallow origin which is not inverted.

Another nototribe flower, which is polypetalous, is Impatiens—at least, some of the species. They must have become sternotribe and then become inverted by becoming pendulous.[21]

Carlinville, Ill.

Some notes on Western Umbelliferæ. III.

JOHN M. COULTER AND J. N. ROSE.

Peucedanum Austinæ, n. sp. Resembling P. Hallii, but with leaf-segments larger and pinnate with narrow often toothed divisions; flowers purplish; fruit as in P. Hallii ($3\frac{1}{2}$ lines long, $1\frac{1}{2}$ lines broad), except oil-tubes solitary in the dorsal intervals, mostly 2 in the laterals, 4 on the commissural side, and an additional one in each group of strengthening cells: seed-face concave, with central longitudinal ridge.—California. Plumas county (*Mrs. R. M. Austin*, June, 1880); near Yreka (*Greene* 732). Distributed as *P. Hallii* Watson.

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[18] Darwin, "Fertilization of Orchids," 16.

[19] Gray's "Structural Botany," figs. 466 and 466a.

[20] BOT. GAZETTE XII, 288.

[21] Flores pedicello debili fulti, sæpius propter pondus calcaris invertuntur, et calcar, reversa posticum, anticum apparet. Benth. & Hook. Gen. Plantarum, I, 277, Impatiens.

Peucedanum Grayi=*P. millefolium* Watson, King's Rep. v. 129, a name which must give way to the older *P. millefolium* of Sonder, from South Africa.

Peucedanum Parishii, n. sp. Caulescent, from a few inches to a foot high, glaucous, closely pubescent, from a thick elongated root: leaves pinnate, with pinnatifid to entire leaflets, the ultimate oblong-linear segments cuspidate, somewhat toothed or entire; root-leaves sometimes nearly entire or few-cleft: umbel 3 to 8-rayed, with no involucre, and involucels of small linear-lanceolate scarious-margined bractlets; rays an inch or more long; pedicels 2 to 4 lines long; flowers white: fruit somewhat obovate, glabrous, 3½ to 5 lines long, 2 to 3 lines broad, with narrow wings, and filiform or obsolete dorsal and intermediate ribs: oil-tubes exceedingly small, often obscure, 6 to 8 in the intervals, 8 to 10 on the commissural side: seed-face concave.—California, Bear Valley, alt. 6,500 ft. (*Parish* 1828); high ridges, north side of "Old Baldy" Mountain, San Bernardino county (*Parish* 1942). Collected at the former station June, 1886; at the latter, June, 1887.

Peucedanum Pringlei, n. sp. Very short caulescent or acaulescent, with several stout peduncles, 6 to 12 inches high from a common root, tomentose-pubescent: leaves rather small, pinnately decompound, with numerous short linear segments: umbel somewhat equally 6 to 12-rayed, with no involucre, and involucels of linear-lanceolate more or less tomentose bractlets; rays 1 to 3 inches long; pedicels 3 to 5 lines long; flowers white: calyx-teeth obsolete: fruit nearly orbicular, becoming glabrous at maturity, 4 to 6 lines long, 3½ to 4 lines broad, with thin membranous wings broader than the body, and filiform dorsal and intermediate ribs: oil-tubes large and solitary in the intervals (an occasional secondary one in the lateral intervals), 4 on the commissural side: seed deeply sulcate beneath the oil-tubes, with plane face.—California, San Diego county (*Pringle, Parry, Vasey*); New Mexico, Upper Gila (*Greene*). Flowers in April. Distributed variously as P. dasycarpum, P. caruifolium and P. fœniculaceum.

Peucedanum Watsoni, n. sp. Apparently acaulescent, but with a short subterranean stem from a deep-seated globose or oblong tuber with clusters of rootlets over its surface, and with or without a thick elongated root below, 2 or 3 inches

high, glabrous or puberulent: leaves bipinnate, the ultimate segments short and linear-oblong: umbel unequally 1 to 5-rayed, with no involucre, and involucels of more or less united often toothed bractlets; rays from almost wanting to an inch long: flowers white: fruit sessile or nearly so, ovate, rough-puberulent, 3 lines long, 1½ lines broad, with very narrow wings, and filiform or almost obsolete dorsal and intermediate ribs: oil-tubes (sometimes wanting) very obscure, 3 to 6 in the intervals, 1 in each rib, and 6 on the commissural side: seed-face plane.—Washington Territory, Cimcoe Mts. (*Howell*, in 1881), Cascade Mts. (*Brandegee*, in 1882, no. 320 of Canby's N. Transcontinental Survey), mountain summits near Columbus (*Suksdorf*), summit of high hills, Klickitat Co. (*Howell* 411, 412, 413); Oregon, high hills near the Dalles (*Howell C.*, in 1882), also Alkali (*Howell* 830, in 1882). Flowers May, June.

With pleasure we dedicate this mountain Peucedanum to one who has so long been a student of this perplexing genus.

Peucedanum Brandegei, n. sp. Short caulescent, glabrous, 6 inches to a foot high, from a thick elongated root: leaves ternately decompound, the ultimate segments lanceolate (6 to 12 lines long, 1½ to 3 lines wide), cuspidate pointed: umbel 6 to 12-rayed, with no involucre and involucels of few linear or setaceous bractlets; rays 3 to 6 lines long, pedicels not more than a line, both reflexed at maturity: flowers yellow: calyx-teeth evident: fruit (immature) oblong, glabrous, about 4 lines long and 2 lines broad (undoubtedly becoming larger), with wings about half as broad as body, and prominent or even slightly winged dorsal and intermediate ribs: oil-tubes 2 to 4 in the intervals, 4 to 6 on the commissural side.—Collected in Canby's N. Transcontinental Survey, in the Walla Walla region, Washington Territory, May, 1883 (*Brandegee* 799, *Tweedy* 856).

Peucedanum Hendersonii, n. sp. Acaulescent, from a shallow nearly globose constricted tuber (½ to 1 inch in diameter), glabrous: leaves ternate then bipinnate, ultimate segments short and obtuse: umbel equally 2 to 5-rayed, with no involucre, and involucels of linear acuminate scarious bractlets; rays about half-inch long; pedicels 1½ to 2 lines long; flowers white (Orogenia-like): fruit ovate, glabrous, 2½ lines long, 2 lines broad, with thickish narrow wings (not half as broad as body) more or less involute, filiform or nearly obsolete dorsal and intermediate ribs, and a rather prominent ridge

on the commissural face: oil-tubes solitary in the intervals, 2 on the commissural side: seed-face plane.—Oregon, John Day Valley, on high hill-tops, May, 1882 (*Howell* B in part), Lost Valley, June, 1882 (*Howell* 410). The fruit of this species, in its thickish involute wings and rather prominent commissural ridge, very nearly approaches that of *Orogenia fusiformis* Watson. Dedicated to L. F. Henderson, one of our best Oregon collectors.

Crawfordsville, Ind.

BRIEFER ARTICLES.

A date palm fungus (*Graphiola Phœnicis* Poit).—In the early part of 1887 this fungus was abundant on the fronds of the date palm in one of the conservatories of the United States Department of Agriculture, Washington, D. C. As it appeared again this spring with greater severity, and has been reported from other parts of the United States, it may be of interest to state briefly what is known concerning it, more particularly because its anomalous structure renders it a very interesting parasite.

This fungus appears indifferently on either side of the frond or axis in the form of small, roundish, sub-epidermal swellings, scattered or contiguous, which finally rupture the epidermis and protrude as black spore-bodies. These are rarely more than 1 to 1.5 mm. in diameter by 0.5 mm. high, the base being somewhat broader than the apex. As these bodies mature they become crateriform and from their center projects a curious bundle of bright yellow filaments, several millimeters in length. Filling the bottom of this cavity and suspended between the filaments at this stage of growth are innumerable sulphur yellow spores which, when the fronds are shaken, fly off in a manner quite suggestive of diminutive showers of pine pollen. Most of these spore-bodies were very superficial, being confined exclusively to the epidermis, the deeper tissues of the frond being green quite up to the borders of the fungus and beneath it. In some instances, however, the deeper tissues also suffered, and in a very few they had become yellow for a distance of several millimeters, especially in the direction of the longer axis of the pinnæ, and particularly when the fruit bodies were clustered. On some fronds there were hundreds of these bodies, so that they had a fly-specked appearance. Other fronds upon the same plant appeared to be less affected, and some adjacent plants were entirely exempt.

According to Fischer, the black rim of the crater, the peridium, grows out of a hyphæ-complex, or pseudo-parenchymatous substratum, and consists of parallel hyphæ arranged nearly at right angles to the plane of the frond. These hyphæ are more or less branched, and are